

Hydrogen sulphide

Print date 13.12.2024
Revision date 13.12.2024
Version 17.0 (en)
replaces version of 19.04.2024 (16.0)

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Trade name/designation Hydrogen sulphide
Art-Nr(n). 0900-0909
Substance name Hydrogen sulphide
Index No 016-001-00-4
EC No 231-977-3
REACH No. 01-2119445737-29
CAS No 7783-06-4

1.2 Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture

Use only as an intermediate under strictly controlled conditions.

1.3 Details of the supplier of the safety data sheet

Supplier

GHC Gerling, Holz & Co. Handels GmbH
Ruhrstraße 113
D-22761 Hamburg
Telephone +49 40 853 123 0
E-mail hamburg@ghc.de
Website www.ghc.com

Department responsible for information:
GHC Gerling, Holz & Co. Handels GmbH
Telephone +49 40 853 123 0

E-mail (competent person):
msds@ghc.de

1.4 Emergency telephone number

EN: Poison Information Center Mainz +49 6131 19240

* SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 [CLP] Classification procedure

Flam. Gas 1A, H220
Press. Gas (Liq.), H280
Acute Tox. 2, H330
Eye Irrit. 2, H319
STOT SE 3, H335
Aquatic Acute 1, H400

Hazard statements for physical hazards

H220 Extremely flammable gas.
H280 Contains gas under pressure; may explode if heated.

Hazard statements for health hazards

H319 Causes serious eye irritation.
H330 Fatal if inhaled.
H335 May cause respiratory irritation.

Hazard statements for environmental hazards

H400 Very toxic to aquatic life.

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* **2.2 Label elements*** **Labelling according to Regulation (EC) No 1272/2008 [CLP]****Hazard pictograms**

GHS02



GHS06



GHS09

Signal word

Danger

Hazard statements

H220 Extremely flammable gas.
 H280 Contains gas under pressure; may explode if heated.
 H319 Causes serious eye irritation.
 H330 Fatal if inhaled.
 H335 May cause respiratory irritation.
 H400 Very toxic to aquatic life.

*

Precautionary statements

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
 P260 Do not breathe gas/vapours.
 P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
 P315 Get immediate medical advice/attention.
 P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
 P403 Store in a well-ventilated place.
 P405 Store locked up.

Supplemental hazard information

Please return container with residual pressure.

2.3 Other hazards**Adverse human health effects and symptoms**

Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.
 Contact with liquid may cause cold burns/frostbite.

Other adverse effects

The substance/mixture does not contain components identified as having endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated Regulation (EU) 2017/2100 or Commission Delegated Regulation (EU) 2018/605 in quantities of 0.1% or more.

Results of PBT and vPvB assessment

The substance/mixture does not contain components meeting the PBT/vPvB criteria of the Reach Regulation, Annex XIII, at levels of 0.1% or higher.

SECTION 3: Composition / information on ingredients**3.1 Substances**

Substance name	Hydrogen sulphide
Index No	016-001-00-4
EC No	231-977-3
REACH No.	01-2119445737-29
CAS No	7783-06-4
Specific concentration limit (SCL)	Acute Tox. 2;H330: 440 ppmV (Gase)

Additional information

Content: >= 99 %

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3.2 Mixtures

not applicable

SECTION 4: First aid measures

4.1 Description of first aid measures

General information

Remove contaminated, saturated clothing immediately.
Call a physician immediately.
First aider: Pay attention to self-protection!

Following inhalation

Remove casualty to fresh air and keep warm and at rest.
In the event of pulmonary irritation treat initially with corticoid spray, e.g. Ventolair- or Pulmicort- metered-dose aerosol (Ventolair and Pulmicort are registered trademarks).
In case of respiratory standstill give artificial respiration by respiratory bag (Ambu bag) or respirator. Obtain medical assistance.

Following skin contact

In case of skin contact rinse with warm water.
In case of frostbite, wash with plenty of water; do not remove clothing.
In case of frostbite rinse with lukewarm (not hot) water for at least 15 minutes. Do not remove clothing frozen to the skin.
Thaw with lukewarm water. Apply a sterile dressing. Obtain medical assistance.

After eye contact

Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical assistance.

Following ingestion

Ingestion is not considered a potential route of exposure.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms

Unconsciousness
Dyspnoea
Cardiac arrhythmias
Nausea
Headache

Effects

Pulmonary oedema

4.3 Indication of any immediate medical attention and special treatment needed

Notes for the doctor

Treat symptomatically.
Pulmonary oedema prophylaxis.
To supervise the blood circulation.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media

Extinguishing powder
Foam
Water spray jet

Unsuitable extinguishing media

Carbon dioxide (CO₂)
Full water jet

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5.2 Special hazards arising from the substance or mixture

Hazardous combustion products

In case of fire formation of dangerous gases possible.
Sulphur oxides

5.3 Advice for firefighters

Special protective equipment for firefighters

Wear a self-contained breathing apparatus and chemical protective clothing.

Additional information

If possible, shut off gas valves and move containers to a safe location.
Use water spray jet to protect personnel and to cool endangered containers.
Exposure to fire may cause rupture / explosion of the containers.
Do not extinguish a leaking gas flame unless absolutely necessary. Spontaneous/explosive re-ignition may occur. Extinguish any other fire.
Dispose of fire residues and contaminated extinguishing water in accordance with local, official regulations.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

Use personal protection equipment.
Leave the danger area.
Keep people away and stay on the upwind side.

For emergency responders

Personal protection by wearing close-fitting protective clothing and breathing apparatus.
Pay attention to extension of gas especially at ground (heavier than air) and in direction of the wind.
Eliminate all ignition sources if safe to do so.
Remove persons to safety.

6.2 Environmental precautions

If possible, stop flow of product.
Do not allow to enter into soil/subsoil.
Do not allow to enter into surface water or drains.

6.3 Methods and material for containment and cleaning up

For containment

If necessary, secure leaky pressure receptacles using a salvage container.
Prevent the liquid from spreading over a wide area (set up barriers, cover sewage systems).
Limit expansion of the gas (water spray jet).

For cleaning up

Leave to vapourize.
Provide adequate ventilation.

6.4 Reference to other sections

Disposal: see section 13
Personal protection equipment: see section 8

SECTION 7: Handling and storage

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7.1 Precautions for safe handling

Protective measures

Use only in well-ventilated areas.
 Transfer and handle product only in closed systems.
 Usual measures for fire prevention.
 Containers' temperature should not be increased above 50 °C.
 The working pressure in the receptacle must not exceed the saturation vapour pressure of the pure product resulting at a temperature of 50 °C.
 Prevent cylinders from falling over.
 Take precautionary measures against static discharges. Ground barrels and installations. Use only antistatically equipped (spark-free) tools.
 Use explosion-proof machinery, apparatus, ventilation facilities, tools etc.
 Ensure valve protection device is correctly fitted.
 Ensure valve outlet cap nut or plug (where provided) is correctly fitted.
 Open valve slowly to avoid pressure shock.
 Do not allow backflow into the container.
 Entering of water into the container must be prevented.
 No water to valves, flanges and other fittings.
 Purging of pipes and valves with inert gases - to avoid: water, solvents.

Advices on general occupational hygiene

When using do not eat, drink, smoke, sniff.
 Wash hands before breaks and after work.
 Remove contaminated clothing and protective equipment before entering eating areas.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage rooms and vessels

All regulations and local requirements for the storage of containers have to be respected.
 Keep container tightly closed and in a well-ventilated place.
 Containers' temperature should not be increased above 50 °C.
 Prevent cylinders from falling over.
 Only use containers specifically approved for the substance/product.
 Risk of hydrogen embrittlement.
 Information on suitable materials for receptacles and valves see ISO 11114.

Materials to avoid

Do not store together with explosives.
 Do not store together with flammable liquids.
 Do not store together with flammable solids.
 Do not store together with pyrophoric and self-heating substances.
 Do not store together with oxidizing liquids or oxidizing solids.
 Do not store together with toxic liquids or toxic solids.
 Do not store together with infectious substances.
 Do not store together with radioactive material.
 Do not store together with food or feed.

7.3 Specific end use(s)

Recommendation

Use only as an intermediate under strictly controlled conditions.
 An exposure scenario is not required.

*** SECTION 8: Exposure controls/personal protection**

*** 8.1 Control parameters**

*** Occupational exposure limit values**

CAS No	EC No	Substance name	occupational exposure limit value
7783-06-4	231-977-3	Hydrogen sulfide	5 [ml/m ³ (ppm)] 7 [mg/m ³] Short-term(ml/m ³) 10 (1) Short-term(mg/m ³) 14 (1) (1) 15 minutes reference period (IE)

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DNEL worker

CAS No	Substance name	DNEL value	DNEL type	Remark
7783-06-4	Hydrogen sulphide	2 mg/kg bw/day	acute dermal, short-term (systemic)	Assessment factor 1
7783-06-4	Hydrogen sulphide	14 mg/m ³	acute inhalative (local)	Assessment factor 1
7783-06-4	Hydrogen sulphide	14 mg/m ³	acute inhalative (systemic)	
7783-06-4	Hydrogen sulphide	1 mg/kg bw/day	long-term dermal (systemic)	Assessment factor 2
7783-06-4	Hydrogen sulphide	7 mg/m ³	long-term inhalative (local)	Assessment factor 2
7783-06-4	Hydrogen sulphide	7 mg/m ³	long-term inhalative (systemic)	Assessment factor 2

PNEC

CAS No	Substance name	PNEC Value	PNEC type	Remark
7783-06-4	Hydrogen sulphide	0.007 mg/L	air	
7783-06-4	Hydrogen sulphide	0.03 µg/L	aquatic, freshwater	Assessment factor 50
7783-06-4	Hydrogen sulphide	0.19 µg/L	aquatic, intermittent release	
7783-06-4	Hydrogen sulphide	0.003 µg/L	aquatic, marine water	Assessment factor 500
7783-06-4	Hydrogen sulphide	1.33 mg/L	sewage treatment plant (STP)	Assessment factor 10

8.2 Exposure controls**Appropriate engineering controls****Technical measures to prevent exposure**

Transfer and handle only in enclosed systems.
 Use only as an intermediate under strictly controlled conditions.

Personal protection equipment**Eye/face protection**

Protective goggles according to EN 166, in case of increased risk add protective face shield.

Hand protection

Safety gloves according to EN 374:
 Glove material specification [make/type, thickness, permeation time/life]: NBR; 0,11 mm; >= 480 min

Body protection:

Safety shoes with steel toecap.
 Body covering work clothing or chemical resistant suit at increased risk.

Respiratory protection

Keep self contained breathing apparatus readily available for emergency use.
 Respiratory protection necessary at:
 high concentrations
 Respiratory protection complying with EN 137.
 Short term: filter apparatus, Filter B
 In case of rescue and maintenance activities in storage containers use environment-independent breathing apparatus because of risk of suffocation due to displacement of oxygen.

Thermal hazards

Use cold-resistant protective equipment.

Environmental exposure controls**Remark**

Prevent release to the environment.

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SECTION 9: Physical and chemical properties**9.1 Information on basic physical and chemical properties****Physical state**

Gaseous / liquefied under pressure.

Colour

colourless

Odour

like:
rotten eggs

Safety relevant basis data

	Value	Method	Source, Remark
Odour threshold:			not determined
Melting point/freezing point			not applicable
Boiling point or initial boiling point and boiling range	-60.2 °C		
flammability			Extremely flammable gas (H220).
Lower and upper explosion limit	Upper explosion limit 50.2 Vol-%		
Lower and upper explosion limit	Lower explosion limit 3.9 Vol-%		
Flash point			not applicable
Auto-ignition temperature	270 °C		
Decomposition temperature			No decomposition if used as directed.
pH			not applicable
Viscosity			not applicable
Solubility(ies)	Water solubility 3.98 g/L (20°C)		
Partition coefficient n-octanol/water (log value)	-1.38		
Vapour pressure	18190 hPa (20°C)		
Density and/or relative density			not applicable
Relative vapour density	1.19		air = 1
particle characteristics			not applicable

9.2 Other information**Information with regard to physical hazard classes****Gases under pressure****Safety characteristics**

	Value	Method, Result	Source, Remark
Critical temperature	100.1 °C		

Other information

Vapours are heavier than air.

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SECTION 10: Stability and reactivity**10.1 Reactivity**

May form an explosive mixture with air.

10.2 Chemical stability

The substance is chemically stable under recommended conditions of storage, use and temperature.

10.3 Possibility of hazardous reactions

Reactions with numerous chemical compounds.
 Reactions with ammonia.
 Reactions with amines.
 Reactions with halogenated compounds.
 Reactions with oxidising agents.

10.4 Conditions to avoid

Heat sources / heat - risk of bursting.
 Humidity.
 Ignition sources, open flames, glowing metal surfaces, etc.

10.5 Incompatible materials

Copper, brass and other copper alloys
 Oxygen
 Acids
 Alkali (lye)
 Sulphur dioxide (SO₂)

10.6 Hazardous decomposition products

When handled and stored appropriately, no dangerous decomposition products are known.

SECTION 11: Toxicological information**11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008****Acute toxicity****Animal data**

	Effective dose	Method, Evaluation	Source, Remark
Acute oral toxicity	LD50: 49 mg/kg Species Rat	OECD 401	Analogous to a similar product.
Acute dermal toxicity	LD50: 124 mg/kg Species Rat	OECD 402	Analogous to a similar product.
Acute inhalation toxicity	CAS No7783-06-4 Hydrogen sulphide Acute inhalation toxicity (gas) LC50: 444 ppm Species Rat Exposure time 4 h	OECD 403	

Assessment/classification

Fatal if inhaled.

Skin corrosion/irritation**Other information**

Study technically not feasible.

Serious eye damage/irritation**Animal data**

Result / Evaluation	Method	Source, Remark
Irritant. Species Rat	Exfoliative cytological examination of the eyes.	

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Assessment/classification
Causes serious eye irritation.

Sensitisation to the respiratory tract

Assessment/classification
No data available

Skin sensitisation

Other information
Study technically not feasible.

Germ cell mutagenicity

	Value	Method	Result / Evaluation	Remark
In vitro mutagenicity/genotoxicity	Species mouse lymphoma cells	OECD 476	negative	
In vivo mutagenicity/genotoxicity	Inhalation Species Rat	OECD 478	negative	

Assessment/classification
Based on available data, the classification criteria are not met.

Carcinogenicity

Assessment/classification
No data available

Reproductive toxicity

Animal data

	Value	Method	Result / Evaluation	Remark
Reproductive toxicity	inhalative NOAEC ≥ 80 ppm Species Rat	OECD 421		

Assessment/classification
Based on available data, the classification criteria are not met.

STOT-single exposure

STOT SE 1 and 2

Assessment/classification
Based on available data, the classification criteria are not met.

STOT SE 3

Irritation to respiratory tract

Assessment/classification
May cause respiratory irritation.

STOT-repeated exposure

Animal data

	Effective dose	Method	Specific effects:	Organs affected:	Source, Remark
Inhalative specific target organ toxicity (repeated exposure)	NOAEL(C): 10.1 ppm Species Mouse	OECD 413			

Assessment/classification
Based on available data, the classification criteria are not met.

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Aspiration hazard

Assessment/classification
 Study technically not feasible.

11.2 Information on other hazards

No data available

SECTION 12: Ecological information**12.1 Toxicity****Aquatic toxicity**

	Effective dose	Method, Evaluation	Source, Remark
Acute (short-term) fish toxicity	LC50: > 0.0198 mg/L Species Lepomis macrochirus (Bluegill) Test duration 96 h		
Chronic (long-term) fish toxicity	not determined		
Acute (short-term) toxicity to crustacea	EC50 0.02 mg/L Species Baetis vagans Test duration 48 h	OECD 202	
Chronic (long-term) toxicity to aquatic invertebrate	not determined		
Acute (short-term) toxicity to algae and cyanobacteria	EC50 1.87 mg/L Species Chlorella fusca Test duration 24 h		
Chronic (long-term) toxicity to aquatic algae and cyanobacteria	not determined		
Toxicity to other aquatic plants/organisms	not determined		
Toxicity to microorganisms	EC50 29 mg/L Species activated sludge	ISO 8192	

12.2 Persistence and degradability

Assessment/classification
 No data available

12.3 Bioaccumulative potential

Assessment/classification
 Based on the n-octanol/water partition coefficient accumulation in organisms is not expected.

12.4 Mobility in soil

Assessment/classification
 No data available

12.5 Results of PBT and vPvB assessment

The substance/mixture does not contain components meeting the PBT/vPvB criteria of the Reach Regulation, Annex XIII, at levels of 0.1% or higher.

12.6 Endocrine disrupting properties

No data available

12.7 Other adverse effects

No data available

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SECTION 13: Disposal considerations**13.1 Waste treatment methods****Waste codes/waste designations according to EWC/AVV**

Waste code product	Waste name
160504 *	gases in pressure containers (including halons) containing hazardous substances

Appropriate disposal / Product

Waste disposal according to directive 2008/98/EC, covering waste and dangerous waste.
 Prevent release to the environment. No disposal via the sewage.

Appropriate disposal / Package

Transportable pressure equipment (empty, residual pressure): Return to supplier / manufacturer.

SECTION 14: Transport information

	Land transport (ADR/RID)	Sea transport (IMDG)	Air transport (ICAO-TI / IATA-DGR)
14.1 UN number or ID number	UN 1053	UN 1053	UN 1053
14.2 UN proper shipping name	HYDROGEN SULPHIDE (Hydrogen sulphide)	HYDROGEN SULPHIDE (Hydrogen sulphide)	Hydrogen sulphide (Hydrogen sulphide)
14.3 Transport hazard class(es)	2.3 (2.1)	2.3 (2.1)	2.3 (2.1)
14.4 Packing group	-	-	-
14.5 Environmental hazards	ENVIRONMENTALLY HAZARDOUS	ENVIRONMENTALLY HAZARDOUS Marine pollutant	ENVIRONMENTALLY HAZARDOUS

14.6 Special precautions for user

The protective measures listed in Sections 6, 7 and 8 of the Safety Data Sheet have to be considered.

14.7 Maritime transport in bulk according to IMO instruments

No carriage in bulk.

Land transport (ADR/RID)

UN number or ID number	UN 1053
UN proper shipping name	HYDROGEN SULPHIDE (Hydrogen sulphide)
Transport hazard class(es)	2.3 (2.1)
Hazard label(s)	2.3+2.1
Classification code	2TF
Packing group	-
Environmental hazards	ENVIRONMENTALLY HAZARDOUS
Limited quantity (LQ)	0
Special provisions	-
Tunnel restriction code	B/D

Remark

ADR / RID: Environmentally hazardous substance - special marking: symbol "fish and tree".

Sea transport (IMDG)

UN number or ID number	UN 1053
UN proper shipping name	HYDROGEN SULPHIDE (Hydrogen sulphide)
Transport hazard class(es)	2.3 (2.1)
Packing group	-

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Environmental hazards	ENVIRONMENTALLY HAZARDOUS
Limited quantity (LQ)	0
Marine pollutant	Yes.
EmS	F-D, S-U

Air transport (ICAO-TI / IATA-DGR)

UN number or ID number	UN 1053
UN proper shipping name	Hydrogen sulphide (Hydrogen sulphide)
Transport hazard class(es)	2.3 (2.1)
Packing group	-
Environmental hazards	ENVIRONMENTALLY HAZARDOUS

SECTION 15: Regulatory information**15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture****EU legislation****Restrictions of occupation**

Observe employment restrictions under the Maternity Protection Directive (92/85/EEC) for expectant or nursing mothers.
 Observe restrictions to employment for juvenils according to the 'juvenile work protection guideline' (94/33/EC).

Other regulations (EU)**To follow:**

Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), Annex XVII No 40.
 Directive 2012/18/EU on the control of major-accident hazards involving dangerous substances.
 National and local regulations concerning chemicals shall be observed.

15.2 Chemical Safety Assessment**National regulations**

For this substance a chemical safety assessment is not required.

SECTION 16: Other information**Abbreviations and acronyms**

Flam. Gas 1A: Flammable gas, Category 1A
 Press. Gas (Comp.): Compressed gas (CG)
 Press. Gas (Liq.): Liquefied gas (LG)
 Eye Irrit. 2: Eye irritation, Category 2
 STOT SE 3, H335: Specific target organ toxicity (single exposure), Category 3
 Aquatic Acute 1: Short-term (acute) aquatic hazard, Category 1
 Acute Tox. 2, H330: Acute Toxicity (inhalation), Category 2

Key literature references and sources for data

Information from our suppliers and data from the "GESTIS Substances Database" and the "Registered Substances" database of the European Chemicals Agency (ECHA) were used to create this safety data sheet.

Additional information

The information contained herein is based on the state of our knowledge. It characterizes the product with regard to the appropriate safety precautions. It does not represent a guarantee of the properties of the product.

Relevant H- and EUH-phrases (Number and full text)

H220	Extremely flammable gas.
H280	Contains gas under pressure; may explode if heated.
H330	Fatal if inhaled.
H335	May cause respiratory irritation.
H400	Very toxic to aquatic life.

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Indication of changes

* Data changed compared with the previous version